



March 18, 2003

Tom Gainer, P.E.
Environmental Engineer
Cleanup and Portland Harbor
Oregon Department of Environmental Quality, Northwest Region
2020 SW Fourth Avenue, Suite 400
Portland, OR 97201-4987

**Subject: Voluntary Cleanup Review Notice
Port of Portland Dredge Base
6208 N. Ensign Avenue
Portland, OR 97217
ESCI No. 2425**

Dear Tom:

This letter responds to DEQ's Voluntary Cleanup Review Notice issued to the Port on January 30, 2003 in connection with the Dredge Base at Swan Island Lagoon. This information is submitted voluntarily and is based upon readily available information obtained within the Port's records.

The 6208 N. Ensign Avenue upland property is the location of the Port of Portland Navigation Division's office. The Port believes that this location has been identified for evaluation of whether a Preliminary Assessment is warranted under ORS 465.245 based upon incomplete or erroneous information. According to DEQ records (Table 5-1, Potential Upland Sources; *Source Control Pilot Project*; URS/023430006.xls), this property was selected for further investigation based on the screening criteria of an SIC Type. The SIC Type listed in the table is "Heavy Construction, Ship Building and Repair." Activities occurring at the upland property are administrative in nature and no heavy construction or ship building and repair has occurred.

The facility consists of administrative offices of the Port's Navigational Department. Any storm water releases from this facility are covered by the Port's Municipal Separate Storm Water Permit issued by the DEQ. In addition, the information provided reflects that there is no evidence of any impermissible release or a threat of release by the Port into the City's storm water system.

Consequently, at your earliest opportunity after review of the included information, we would appreciate your confirmation that this property is not appropriate for any further review.

Tom Gainer
March 18, 2003
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Please call me if you have any additional questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. B. Summers', with a long horizontal flourish extending to the right.

Anne B. Summers
Environmental Project Manager

Enclosures

c: Jim Anderson, DEQ (w/o attachments)
David Ashton, Port (w/o attachments)
Bill Bach, Port (w/o attachments)
John Childs, Port (w/o attachments)
Rob Cook, Port (w/o attachments)
Kristi Maitland, Port (w/o attachments)
Bob Teeter, Port
Port Project File

SITE ASSESSMENT INFORMATION REQUEST

Please provide the following information to assist in DEQ's evaluation of the site. Address each item as completely as possible. When you cannot address a particular item because of a lack of information, please state so.

1. PROVIDE THE FOLLOWING BACKGROUND INFORMATION:

- Facility name and address.

Port of Portland Dredge Base
6208 North Ensign Avenue
Portland, OR 97217

- Facility owner/operator name, title, address, and phone number.

Port of Portland
121 NW Everett
Portland, OR 97209

Contact Person: Anne Summers
Environmental Program Manager
503-944-7508

- Property owner (if different from facility owner/operator) name, address, and phone number.

Same as above.

- Current use of site.

This property is used as a base of operations for the "OREGON", a navigational dredge managed by the Port's Navigation Department. The OREGON is used to support the Port's mission of facilitating waterborne commerce by maintenance of the navigational channels in the Lower Columbia River Basin. The upland portion is used for office space for the support and maintenance staff of the OREGON. The Columbia River Channel Deepening Coalition also leases a small portion of the office space. The dredge and associated shop are located on the water, and are operated under the regulatory authority of the U.S. Army Corps of Engineers (USACE) and the U.S. Coast Guard (USCG). The information provided for this request will focus on the upland portion of the property since the on-water operations have no impact on the City's storm water system.

- Past use of site: include all you know about previous owners and users of site, and associated dates.

The Port of Portland acquired this property in 1967 from the State Land Board (Division of State Lands). The earliest record of occupancy identified in available Port records is a 1973 lease agreement between the Port and Pacific Inland Navigation Company (known as PAC) for offices and tie-up of tugs and barges. As part of the lease agreement, the Port moved the PAC office building from Vancouver, Washington to the subject property and made associated improvements to the property. PAC installed an industrial water supply well on the property in 1974. PAC assigned the lease to the Puget Sound Tug and Barge Company, a subsidiary of Crowley Maritime Corporation (Crowley) in 1976, with Crowley as the guarantor. The lease remained in effect through June 1986.

Port records reflect that American President Distribution Services Ltd. leased a portion of the office space from June 1988 through December 1990. This company was a transportation broker for domestic intermodal freight and used the office space for administrative purposes.

Port records reflect that Legacy Health System (Legacy) was a tenant from July 1989 through June 1995. Legacy used the property as a base of operations for the Emanuel Hospital LifeFlight (helicopter for emergency medical transport). The asphalt area east of the office building was used as the helicopter landing area. In 1990, Legacy installed a 4,000-gallon capacity aboveground storage tank (AST) north of the helicopter landing area, presumably for fuel storage associated with the helicopter. As part of Legacy's lease termination agreement, a Phase I Environmental Site Assessment (ESA) was completed in May 1994, which is included as Attachment A. The Phase I ESA included the collection of one soil sample (6-inch depth) from the area near the fuel dispensing pump of the AST. Laboratory analysis for total petroleum hydrocarbons (TPH) indicated a concentration of TPH as diesel at 10 parts per million (ppm), which was below DEQ soil cleanup levels. The report concluded there were no significant environmental findings or recognized environmental conditions on the property.

In order to comply with the lease termination requirements, Legacy Health System had the AST removed in 1995. Foss Environmental Services evacuated the contents of the tank using a vacuum truck and transported approximately 90 gallons of fuel for off-site disposal. The tank was then cleaned and transported to Foss' Portland facility for storage. The concrete pad was broken up and transported to the Hillsboro Landfill. Two soil samples were collected from the area beneath the tank. Analytical results (see Attachment B) did not detect any petroleum products.

Available Port records reflect that the Port never occupied the property prior to 1995. In December 1995, the Port's Navigation Department began its occupation of the property, using it primarily for office space. Some equipment maintenance did take place on the east side of the property from 1996 through 1999.

- Size of site (in acres or square feet).

Approximately 3.6 acres.

- Site security (is site completely or partially fenced, patrolled, etc.?).

The property is partially fenced. The waterfront area is not fenced. Port of Portland employees are located on site Monday through Friday from approximately 8:00 a.m. to 5:00 p.m. The property is not patrolled during off hours.

- Land uses immediately surrounding the site boundaries (e.g., site is surrounded by agricultural or commercial land, homes to north, etc.).

The area surrounding the property is developed for industrial use. Specifically, the property is bound to the north by United Parcel Service, to the west by Fred Devine Diving & Salvage, to the east by property owned by the Port of Portland, and to the south by Swan Island Lagoon.

2. PROVIDE A SITE MAP WITH THE FOLLOWING ITEMS IDENTIFIED:

- Building names and their functions (past and present).

One office building is located on the property. This building has been used for administrative office purposes since its placement on the property in 1973. There are no additional buildings on the property.

- All chemical and waste storage and disposal areas (buildings, ponds, landfills, piles, etc.); include inactive or abandoned areas.

There are three OSHA-approved storage sheds that are covered, weatherproof, and provide secondary containment. Two of the sheds are used for storage of oil products, specifically, oil in 55-gallon drums, while the third is used to store lead acid batteries prior to recycling at appropriate off-site facilities.

Compressed gas cylinders of oxygen and acetylene (for welding purposes in the on-water dredging operations) are stored upright and chained in an area near the pier.

- Outside process areas.

None.

- Storage tanks.

There is one approved 200-gallon, dual-compartment AST used for storing gasoline and diesel fuel. The capacity of each compartment is 100 gallons. The AST is protected by a rain cover and is provided with secondary containment.

- Waste treatment systems.

None.

- On-site wells (water supply, monitoring, dry wells, abandoned wells).

One water supply well for industrial use was installed by PAC on the property in 1974. The well is located adjacent to the east entrance of the office building. The well is currently not in use.

- Transformers and capacitors on or adjacent to the site.

There are two pad-mounted transformers located on the property. One is located on the northeast side of the parking lot and the other is located near the pier.

3. PROVIDE THE FOLLOWING CHEMICAL/WASTE HANDLING INFORMATION:

- All chemicals used or stored at the site (polychlorinated biphenyls (PCBs), solvents, petroleum products, polycyclic aromatic hydrocarbons (PAHs), phthalates/plasticizers, metals, pesticides, acids, bases, etc.).

Oil, gasoline, and diesel products are stored on the property. Oil is stored in the original containers (55-gallon drums) in two OSHA-approved storage sheds that are covered, weatherproof, and provide secondary containment. Gasoline and diesel fuel products are stored in an approved dual-compartment, 200-gallon AST that is protected by a rain cover and is provided with secondary containment. The AST is in good condition.

Compressed gas cylinders of oxygen and acetylene are stored on the property for use in the on-water welding operations.

- All waste products generated or stored at the site (waste solvents or oils, filter cake, spent plating solutions, metal grindings, etc.).

Used lead acid batteries are stored on the property prior to appropriate off-site recycling in one OSHA-approved storage shed that is covered, weatherproof, and provides secondary containment.

- Approximate volumes of chemicals used and wastes generated per year, and maximum volume kept on-site.

Approximately eight 55-gallon drums of oil are used on an annual basis.

Approximately 6 dozen batteries are recycled off site annually.

- Any on-site chemical or waste-treatment systems (flocculation/filtration, incineration, chemical or physical treatment, volume reduction, etc.).

None.

- Information on all past and present chemical and waste storage/disposal areas; include information on size, type, current or former contents, and condition of each.

Information provided above.

- Type, quantity, and destination of all wastes removed from site (i.e., metal wastes landfilled at county dump site, used solvents recycled by ...).

The used batteries are transferred on an as-needed basis to Marine Terminal 6 for recycling off site.

- Any spills or other releases of hazardous substances that have occurred at the site during your operation or ownership.

None, to the Port's knowledge.

- Any information you have about hazardous substances used, stored, or released at the site by prior owners or operators.

See discussion of Legacy's AST, above.

4. PROVIDE THE FOLLOWING PERMIT INFORMATION:

- Identify all existing or expired regulatory permits. For each, provide information on the type of permit (NPDES, RCRA Interim Status, storm water, etc.), regulating agency (federal, state, sewerage agency), and issue and expiration dates.

Storm water discharges associated with this property are covered under the Port's port-wide general storm water discharge permit. The Port's permit is Municipal Separate Storm Sewer System (MS⁴) discharge permit #101314, which was due to expire on August 31, 2000. The Port submitted its renewal application to DEQ in advance of expiration in February 2000. DEQ approval is still pending. Under DEQ laws and regulations, the existing permit term is extended during the pendency of the renewal application before DEQ. As part of its permit, the Port has a storm water management plan (SWMP) that includes best management practices for the Port's operations. Under this plan the Port conducts annual catch basin cleaning by using a vacuum truck. Catch basin materials are disposed as special wastes. The Port has complied with its MS⁴ permit in relation to this property.

The property is also covered by the port-wide NPDES general permit #1200-CA, which covers storm water discharges related to construction activities. This permit expires on December 31, 2005. Currently, there are no in-progress or planned construction activities being conducted on this property.

5. PROVIDE THE FOLLOWING SAMPLING/CLEANUP INFORMATION:

- Describe all environmental sampling/monitoring performed at site. Provide sampling results.

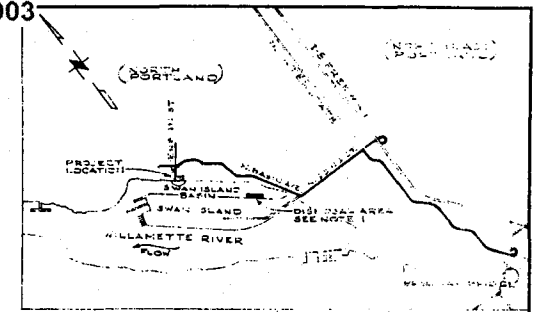
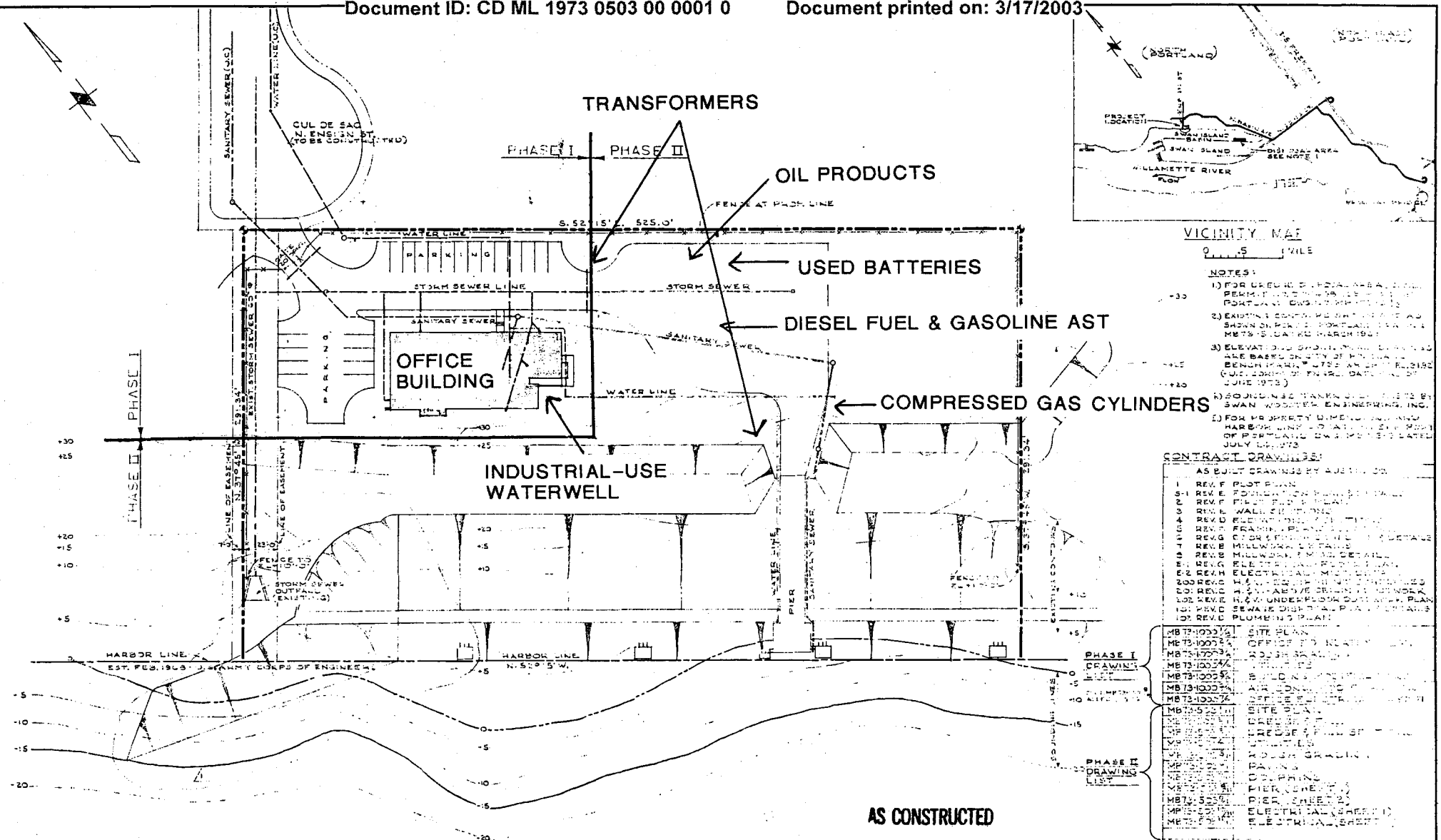
The ESA undertaken by Legacy as part of their lease termination agreement included the collection of one soil sample (6-inch depth) from the area near the fuel dispensing pump associated with the 4,000-gallon AST. Laboratory analysis indicated TPH as diesel at 10 ppm, which was below DEQ soil cleanup levels. See Attachment A.

During removal of Legacy's AST in 1995, two soil samples were collected from the area beneath the tank. Analytical results did not detect any petroleum hydrocarbons. See Attachment B.

- Describe any soil excavations or removals, spill cleanups, groundwater treatment, etc., performed at site.

None have occurred. None are necessary.

(END OF CHECKLIST)



NOTES:

- 1) FOR CURE OF SPECIAL AREA, SEE PERMIT TO EXCAVATE, 1973-1974, PORTLAND, OREGON, 1973-1974.
- 2) EXISTING CONCRETE PAVEMENT AS SHOWN ON PLOT 1, PORTLAND, OREGON, 1973-1974, METS, DATED MARCH 1974.
- 3) ELEVATIONS SHOWN ON THIS PLAN ARE BASED ON CITY OF PORTLAND BENCH MARK, 1973, AND ON ELEVATION (CHECKED BY FIELD DATA) OF JUNE 1973.
- 4) SOUNDING MARKING SYSTEMS BY SWAN, WOODRUFF, ENGINEERING, INC.
- 5) FOR PROPERTY LINES, SEE MAP OF PORTLAND, OREGON, 1973, DATED JULY 1973.

CONTRACT DRAWINGS:

- AS BUILT DRAWINGS BY AUSTIN CO.
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DISCLAIMER: Due to processing, this document may not accurately represent the original document.

PAC FACILITY
SWAN ISLAND
SITE PLAN - PHASE II

DRAWING NO.
ML 73-503 1/1

Attachment A

A Report for

Legacy Health System

**Level I Environmental Site Assessment
Legacy Health System Facility
6208 N. Ensign Street
Portland, Oregon**

**Project EAEX-94-0125
May 31, 1994**

BRAUN INTERTEC NORTHWEST, INC.

BRAUNSM
INTERTEC

Braun Intertec Northwest
5405 North Lagoon Avenue
P.O. Box 17126
Portland, Oregon 97217
503-289-1778 Fax: 289-1918

*Engineers and Scientists Serving
the Built and Natural Environments*

May 31, 1994

Project EAEX-94-125

Mr. Larry Hill
Legacy Health System
1919 N.W. Lovejoy
Portland, Oregon 97209

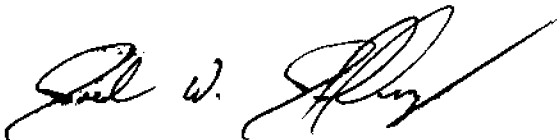
Dear Mr. Hill:

Re: Level I Environmental Site Assessment; Legacy Health System Facility,
6208 N. Ensign Street, Portland, Oregon

In accordance with your written authorization on May 2, 1994, Braun Intertec Northwest, Inc. (Braun Intertec) conducted a level I environmental site assessment of the Legacy Health System Facility site, 6208 N. Ensign Street, Portland, Oregon. The purpose of the assessment was to evaluate the presence or absence of environmental concerns at the site. The assessment results and conclusions are detailed in the attached report.

If you have any questions, please do not hesitate to call us at (503) 289-1778.

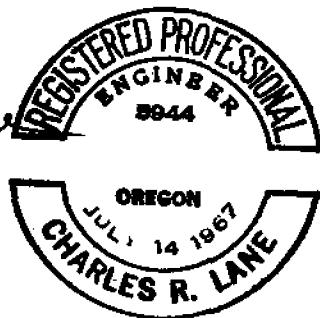
Sincerely,



Joel W. Jeffery
Staff Geologist



Charles R. Lane, P.E.
Senior Engineer



jwj\crl:pas

Attachments: Level I Environmental Site Assessment Report

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Level I Environmental Site Assessment

Legacy Health System facility
6208 N. Ensign Street
Portland, Oregon

1.0 Executive Summary

A level I environmental site assessment of the Legacy Health System facility at 6208 N. Ensign Street, Portland, Oregon was conducted by Braun Intertec Northwest, Inc. (Braun Intertec) to evaluate potential environmental concerns at the site. The following information was obtained during the assessment:

- Four Superfund Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) sites were documented within one-half mile of the site. The mentioned Superfund/CERCLIS sites were all listed with a similar site address, 6767 North Basin Avenue. One listing has been recommended for a no further action (NFA) status by the USEPA and is not anticipated to impact the project site. The remaining three listings were located approximately 1,600 feet northwest of the project site in an assumed down-gradient groundwater location and are not anticipated to impact the project site.
- Nineteen sites on the General Information Resource Conservation and Recovery Act (RCRA) List were documented within one-half mile of the project site.
- One of the listed RCRA generators, Crowley Environmental Services Corp., 6208 N. Ensign Street, had been located on the project site. However, only the corporate offices of Crowley Environmental Services were located on the project site. At the time of this assessment, Crowley Environmental Services Corporation was no longer a tenant of the structure.
- Eight Environmental Cleanup Site Information System (ECSIS) sites were documented within one-half mile of the project site. The nearest ECSIS site, Basin Avenue Boat Dock Drum, 6767 N. Basin Avenue, was located

approximately 1,600 feet northwest of the project site in an assumed downgradient groundwater location and is not anticipated to impact the site.

- Three sites on the list of All Oregon Sources which have acquired air quality permits were documented within one-half mile of the project site.
- Nine sites on the List of Underground Storage Tank (UST) Cleanup sites in Oregon were documented within one-half mile of the project site. None of the mentioned UST cleanup sites are anticipated to impact the project site.
- Twenty sites on the List of Underground Storage Tank Facilities in Oregon were documented within one-half mile of the project site.
- One 4,000 gallon aboveground fuel storage tank was located on the project site.
- Minor surface staining of the soil was noted adjacent to the east end of the fuel storage tank. Laboratory analysis of one soil sample revealed the presence of diesel fuel at a level of 10 parts per million (ppm), significantly less than the most stringent DEQ numeric soil cleanup level of 100 ppm for diesel contaminated soil.
- Asbestos containing building materials consisting of vinyl floor tile were detected in the kitchen and storage room at the project site. These materials do not present a hazard unless disturbed as a result of remodeling or demolition activities.
- One groundwater well was located on the project site.

This report details the sources of information reviewed and obtained from the level I environmental site assessment.

2.0 Introduction

The following report documents the level I environmental site assessment activities conducted at the referenced site by Braun Intertec. Authorization to proceed with this project was received from Mr. Larry Hill of Legacy Health System on May 2, 1994. The results discussed in this report are representative of the conditions observed and evaluated on the respective days of the site assessment. The site location map is depicted in Figure 1.

2.1 Purpose

The purpose of the level I environmental site assessment was to evaluate the presence or absence of environmental concerns based on a site survey and past land-use information available to Braun Intertec.

2.2 Scope of Services

The objectives of the level I environmental site assessment are as follows:

- A review of available geologic information regarding the site and surrounding area;
- A review of past and present land-use activities at the site;
- A review of regulatory information pertaining to the site and surrounding area;
- A reconnaissance of the site to evaluate existing or potential observable environmental concerns; and
- Submission of this report.

2.3 Site Description

The site was a developed lot of approximately 3.54 acres located in the Northeast Quarter of the Southwest Quarter of Section 17, Township 1 North, Range 1 East of the Willamette Meridian in the City of Portland, County of Multnomah and State of Oregon.

The site supported one approximately 5,811 square foot office structure partially occupied by the flight crew of the Lifeflight Medical Emergency Response Helicopter Crew. The project site also supported the helicopter landing pad of the Lifeflight service.

The site was bounded to the northwest by the cul-de-sac terminus of N. Ensign Street and to the south by the Swan Island Lagoon.

3.0 Site Characteristics

3.1 General Geology

The project site is underlain by an extensive alluvial sequence of clays, silt, sand and gravels derived from Pleistocene Age catastrophic glacial flooding of the Columbia River system. Local streams and rivers have subsequently reworked many of the surface deposits to their present day conditions. These alluvial units may be 100 feet or more in thickness and are believed to be underlain by semi-indurated sands and gravels of the Pliocene Age Troutdale Formation. (Geologic Map of the Portland Quadrangle, Multnomah and Washington Counties, Oregon and Clark County, Washington, M.H. Beeson, 1991).

3.2 Local and Regional Hydrogeology

The drinking water supply in the project area is provided by the City of Portland. The water supply for the City of Portland is derived from the Bull Run Reservoir system in the Mt. Hood National Forest.

The major regional aquifer in the project area is the Pliocene Age Troutdale Formation. A review of geologic maps and water well records for the area revealed that the Troutdale Formation lies at a depth of approximately 150 feet beneath surface grades within the project area. (Groundwater Data for the Portland Basin, Oregon and Washington, K.A. McCarthy and D.B. Anderson, 1990)

Downward migration of surface water in the project area may be impeded by impermeable clay or silt horizons found in the underlying alluvial deposits. These impermeable horizons produce saturated zones which lie above the regional water table. We infer that the local perched

groundwater migration direction may mimic surface grades in that groundwater will flow from the north to the south finding surface expression in the Swan Island basin of the north to northwest flowing Willamette River.

4.0 Regulatory Agency Information

4.1 The United States Environmental Protection Agency (USEPA)

4.1.1 Superfund Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS)

The USEPA CERCLIS list for sites in Oregon was reviewed by Braun Intertec to obtain information regarding activities potentially impacting the environment at this site and surrounding areas. CERCLIS is a data base used by the USEPA to track activities conducted under its Superfund program. once a site is added to CERCLIS, the next step in evaluating the potential problems is the completion of a preliminary assessment (PA). Based on the conclusions of the PA, a site could be recommended for a sampling site investigation in order to collect information to evaluate whether a site should be nominated to the National Priorities List (NPL), recommended for no further action (NFA) under the Federal Superfund Program, or recommended for emergency or immediate remedial consideration. If no further Superfund action is needed at a site, it is designated in CERCLIS inventory because the data base is used by USEPA to report Superfund accomplishments to Congress.

Four of the listed Superfund/CERCLIS sites were documented within one-half mile of the site.

- USDOT CG Marine Safety Station, 6767 N. Basin Avenue,
- Swan Island Drum #1, 6767 N. Basin Avenue,
- Swan Island Drum #2, 6767 N. Basin Avenue, and
- Basin Avenue Boat Dock Drum, 6767 N. Basin Avenue

The mentioned Superfund/CERCLIS sites were all listed with a similar site address, 6767 North Basin Avenue. One listing has been recommended for a no further action (NFA) status by the USEPA and is not anticipated to impact the project site. The remaining three listings were

located approximately 1,600 feet northwest of the project site in an assumed downgradient groundwater location and are not anticipated to impact the project site.

4.1.2 National Priorities List (NPL)

The USEPA NPL for sites in Oregon was reviewed by Braun Intertec to obtain information regarding activities potentially impacting the environment at this site and surrounding areas. The NPL is a federal Superfund listing of sites which have received a federal hazard ranking score of greater than 28.5. The sites proposed for and listed on the NPL are those which are eligible for remedial action under the federal Superfund program. There are twelve sites listed, proposed for listing, or nominated for the NPL in Oregon.

None of the listed NPL sites were documented within one-half mile of the site.

4.1.3 General Information Resource Conservation and Recovery Act (RCRA) List of Oregon

RCRA provides the basic framework for federal regulation of hazardous waste. RCRA controls the generation, transportation, treatment, storage and disposal of hazardous waste through a comprehensive "cradle-to-grave" system of hazardous waste management techniques and requirements. RCRA is administered nationally by the USEPA, with major components of the law delegated to the states for ongoing implementation. The General Information RCRA List for the State of Oregon is a list of all RCRA sites in the State of Oregon. The list provides basic information on the site such as facility name and address, type of facility (i.e. generator, transporter, storage etc.), I.D. number and status of the facility. The inclusion of a site on the General Information RCRA List does not mean that environmental contamination has occurred, is occurring, or will occur in the future. The General Information RCRA List serves as an information source as to the location of hazardous waste generation, transportation, treatment, storage and disposal facilities in the State of Oregon.

Nineteen RCRA sites were documented within one-half mile of the site.

The following sites were listed as large quantity generators (greater than 1,000 kilograms per month (Kg/mo) of non-acutely hazardous material):

- Dallas Mavis Forwarding, Inc., 6220 N. Basin Avenue,
- Freightliner Truck Mfg. Plant, 6936 N. Fathom Street,
- Mogul Corp. N. Basin, 6650 N. Basin Avenue, St. 5,
- Stack Steel & Supply Co., 6330 N. Basin Avenue,
- Stratoflex, Inc., 6485 N. Basin Avenue,
- United Parcel Svs, Portland, 6707 N. Basin Avenue, and
- U.S. DOT CG Cutter Glacier WagB4, 6735 N. Basin Avenue.

The following sites were listed as small quantity generators (100 Kg/mo but less than 1,000 Kg/mo of non-acutely hazardous material):

- Cascade Brake Products, 6505 N. Ensign Street,
- Milne Truck Lines, Inc., 5949 N. Basin Avenue,
- Pacific Detroit Allison N. Basin, 5949 N. Basin Avenue,
- Roadway Express, 6845 N. Cutter Circle,
- Roadway Packaging System, 6447 N. Cutter Circle,
- Smith Brothers Fleet Svc., Inc., 5820 N. Basin Avenue,
- U.S. DOT CG Marine Safety Sta., 6767 N. Basin Avenue, and
- U.S. Navy and Marine Reserve C., 6735 N. Basin Avenue.

The following sites were listed as non-regulated small quantity generators:

- Tri West Supply Company, 6650 N. Basin Avenue, St. 2 and
- Viking Freight System, Inc., 6100 N. Basin Avenue.

Penske Truck Leasing Co LP, 6840 N. Cutter Circle Bldg. B was listed as conditionally exempt generator (less than 100 Kg/mo of non-acutely hazardous material).

Crowley Environmental Services Corp., 6208 N. Ensign Avenue, was listed as a transporter of non-acutely hazardous material. The generator status of this site was listed as Unknown. The mentioned RCRA site was listed with the same address as the project site. However, Crowley Environmental Services Corp. does not occupy the project site at this time.

4.2 Oregon Department of Environmental Quality (DEQ)

The following DEQ Listings regarding potential environmental contamination sources were reviewed by Braun Intertec regarding the site.

4.2.1 *Confirmed Release List (CRL) and Inventory of Hazardous Substances Sites*

The Confirmed Release List (CRL) and Inventory of Hazardous Substances sites (Inventory) list was reviewed by Braun Intertec to obtain information regarding activities potentially impacting the environment at the site and surrounding areas. The CRL and inventory lists identify sites throughout the state which are contaminated with hazardous waste, petroleum products and other hazardous substances. The Oregon legislature has directed the DEQ to implement a comprehensive site discover program to:

1. Identify and assess releases or threats of releases of hazardous substances that may require removal or remedial action,
2. Publish two separate lists of facilities, or sites, where releases of hazardous substances have been confirmed:
 - a. A Confirmed Release List (CRL), including all facilities with a confirmed release; and
 - b. An inventory, including facilities with a confirmed release which, in addition, based on a preliminary assessment, DEQ has determined require further investigation, removal, remedial action, or related long-term environmental or institutional controls; and
3. Rank facilities on the Inventory based on the long and short-term threats they pose to public health and the environment.

None of the sites listed on the CRL and Inventory were documented within one-half mile of the site.

4.2.2 *Environmental Cleanup Site Information System (ECSIS)*

ECSIS tracks facilities that pose potential environmental concern. The appearance of a site on ECSIS neither confirms nor denies the release of a hazardous substance at the facility; nor does it indicate whether the facility is contaminated or cleanup is necessary, currently underway or completed.

Eight of the ECSIS sites listed were documented within one-half mile of the site.

- Basin Avenue Boat Dock Drum, 6767 N. Basin Avenue,
- CENEX, 5885 N. Basin Avenue,
- Farmers Union Central Exchange, Inc., 5885 N. Basin Avenue,
- Island Holdings, Inc., 5885 N. Basin Avenue,
- Mocks Bottom, North of Swan Island,
- Swan Island Drum #1, 6767 N. Basin Avenue,
- Swan Island Drum #2, 6767 N. Basin Avenue, and
- U.S. DOT-CG Marine Safety Station, 6767 N. Basin Avenue.

The nearest ECSIS site, Basin Avenue Boat Dock Drum, 6767 N. Basin Avenue was located approximately 1,600 feet northwest of the project site in an assumed downgradient groundwater location and is not anticipated to impact the project site.

4.2.3 *Closure and Regular Solid Waste Active Disposal Permits*

Closure and Regular Solid Waste Active Disposal Permits provide a listing of permitted landfills, waste transfer and recovery stations and waste treatment facilities. No closure and regular solid waste active disposal permit sites were documented within one-half mile of the site.

4.2.4 *List of All Oregon Sources*

The list of All Oregon Sources provides information regarding facilities which have acquired an air quality permit. These facilities may be of potential concern regarding air pollution. There were three facilities documented within one-half mile of the project site.

- CENEX Ag., Inc., 6135 N. Basin Avenue,
- Freightliner Corp., 6936 N. Fathom Street, and
- Wally Humwaldt, 6135 N. Basin Avenue.

4.2.5 List of Underground Storage Tank (UST) Cleanup Sites in Oregon

This list documents all reported below-ground product releases, all above-ground releases exceeding 42 gallons and all above-ground releases to water which result in a sheen on the water.

A review of the UST Cleanup list revealed that nine product releases were documented within one-half mile of the project site.

- Pacific Detroit Diesel Allison, Inc., 5940 N. Basin,
- Oregon Freightways, 5949 N. Basin Avenue,
- Dallas & Mavis Forwarding Co., Inc., 6220 N. Basin Avenue,
- United Parcel Service, 6707 N. Basin Avenue,
- Island Holdings, Inc., 5885 N. Basin Avenue,
- U.S. Navy, 6735 N. Basin Avenue,
- Lynden Farms, 6135 N. Basin Avenue,
- CENEX Ag Inc., 6147 N. Basin Avenue, and
- GI Trucking Roadway Express, Inc., 5820 N. Basin Avenue.

None of the mentioned UST cleanup sites are anticipated to impact the project site. The nearest UST cleanup site, United Parcel Service, 6707 N. Basin Avenue, was located approximately 300 feet northwest of the project site in an assumed cross-gradient groundwater location and is not anticipated to impact the project site.

4.2.6 List of Underground Storage Tank Facilities in Oregon

All registered UST facilities are listed for the State of Oregon. The list provides information on the site such as facility name and address and permit status (i.e. active, decommissioned).

There were twenty registered UST facilities located within one-half-mile of the site. The UST facilities mentioned are listed below:

- CENEX Ag, Inc., 6147 N. Basin,
- Columbia Distributing Co., 6840 N. Cutter Circle,
- Dallas & Mavis Forwarding Co., 6220 N. Basin Avenue,

- Fred Devine Diving & Salvage, Inc., 6211 N. Ensign,
- Island Holdings, Inc. 5617 N. Basin Avenue,
- Island Holdings, Inc., 5885 N. Basin Avenue,
- Lynden Farms, 6135 N. Basin Avenue,
- Milne Truck Lines - Swan Island, 5949 N. Basin Avenue,
- Naval Reserve Readiness Center, 6735 N. Basin Avenue,
- Ness & Company, 6645 N. Ensign,
- N.W. Transport Service, Inc., 6100 N. Basin Avenue,
- P.I.E. Nationwide, Inc., 5550 N. Basin Avenue
- Pacific Detroit Diesel Allison, 5940 N. Basin
- Portland Motor Pool, 6400 N. Cutter Circle,
- Roadway Express, Inc., 5820 N. Basin,
- Roadway Package System, 6447 N. Cutter Circle,
- SDS Co., 6712 N. Cutter Circle,
- United Parcel Service, 6707 N. Basin,
- USCG Marine Safety Office, 6767 N. Basin Avenue, and
- Western Paper Company, 6000 N. Cutter Circle.

None of the mentioned UST facilities are anticipated to impact the project site.

5.0 Site History Review

5.1 Background

In gathering information regarding past and present land-use activities at the site, file reviews were conducted by Braun Intertec personnel at various local offices. Information regarding this site was collected from the City of Portland, Multnomah County, and the Oregon Historical Society. Historical aerial photographs were obtained from the United States Army Corps of Engineers.

5.2 City of Portland

5.2.1 City of Portland Bureau of Planning

According to the zoning map and zone description obtained from the City of Portland Bureau of Planning, the site was located in an area zoned for general industrial use (IG). Adjoining and the surrounding properties to the north, east and west are within the same zoned district. A zoning map of the project area is presented in Figure 2.

5.2.2 City of Portland Bureau of Environmental Services

The site is connected to the City of Portland sewer and water system.

According to the stormwater and sanitary sewer map obtained from the City of Portland, site sewer lines are connected to an 8-inch sanitary sewer line located within N. Ensign Street. Effluent within this part of the system flows to the northeast. Records obtained from the City of Portland indicated that the site was connected to the sanitary sewer system in 1974.

Stormwater runoff from roof drains and stormwater catch basins from the project site is in part directed to a stormwater drainage line located to the west of the site in N. Ensign Street. Effluent within this part of the system flows to the south into the Swan Island Basin.

5.2.3 City of Portland Bureau of Buildings

Records obtained from the City of Portland indicated that a building permit was applied for the existing structure in 1973. Additional plumbing, electrical and mechanical permits were issued in 1974, 1975, 1976, 1983, and 1990 for construction of an electrical system platform, replacement of the HVAC system, and the installation of an aboveground fuel storage tank.

5.2.4 City of Portland Fire Bureau

Conversations with representatives of the City of Portland Fire Bureau indicated that fire department records show that one, approximately 4,000 gallon capacity, aboveground fuel storage tank was installed at the project site in 1990.

5.3 Oregon Historical Society

The Oregon Historical Society maintains copies of the City Directory for the City of Portland published by F.L. Polk and Company. The city directory gives a reference to businesses or individuals located at an address as published within the telephone directory for various years.

A review of the city directories for the City of Portland dated 1925 to 1987 revealed no listing for the site address until 1975 when P.A.C. Fruit Line is listed from 1975 to 1976. In 1977, the address is listed as Crowley Maritime Corporation Steam Ship Lines until 1985. In 1986 and 1987 the address was listed as vacant.

5.4 Historical Aerial Photographs

Historical aerial photographs available through the U.S. Army Corps of Engineers dated 1936, 1948, 1957, 1963, 1974, 1977, 1983 and 1991 were reviewed. Copies of the historical aerial photographs are presented in Appendix A.

The historical aerial photographs dated 1936 and 1948, inclusive of the project site, revealed the site to be an undeveloped lot wholly inundated by water. The project site was bounded to the south, east and west by water.

The historical aerial photographs, inclusive of the project site, dated 1957 and 1963 revealed the site to be a vacant lot raised above river levels by the placement of dredge fill sand. The project site was bounded to the north, east, and west by vacant lots. The project site was bounded to the south by the Swan Island basin.

The historical aerial photographs, inclusive of the project site, dated 1974, 1977, 1983 and 1991 revealed the presence of a structure on the site similar in size and configuration as it appeared during this assessment. The historical aerial photographs also revealed increased commercial and industrial development to the north, east and west.

6.0 Site Reconnaissance

The site reconnaissance of the subject site located at 6208 N. Ensign Street in Portland, Oregon was conducted on May 15, 1994 by a representative of Braun Intertec. Photographs taken during the site reconnaissance are presented in Appendix B.

Observations noted during the site reconnaissance will be divided into building exterior and interior observations.

Exterior Observations

The subject site supported one approximately 5,800 square foot, single-story wood frame and wood exterior wall commercial office building. At the time of this assessment, the structure was partially occupied by the flight crew of the Lifeflight Medical Emergency Response helicopter. The structure was bounded by landscaped and asphalt paved walkway areas. The remaining portions of the site supported asphalt paved driveway and parking areas.

The asphalt paved parking area to the east of the site was used as a helicopter landing area by Lifeflight. One approximately 4,000 gallon capacity aboveground fuel storage tank was located to the north of the helicopter landing area. An examination of the surface soil adjacent to the fuel tank revealed minor soil staining at the east end of the tank near the fuel dispensing pump. One soil sample was acquired from the area at a depth of 6-inches. Laboratory analysis of the soil sample revealed the presence of diesel fuel. Further analysis revealed a diesel fuel concentration of 10 parts per million (ppm) in the soil sample. The concentration of diesel fuel in the soil sample was significantly less than the State of Oregon Department of Environmental Quality's numeric soil cleanup levels of 100 parts per million for diesel fuel contaminated soil.

A ½-ton capacity, 2-wheel drive pickup truck was located adjacent to the west end of the aboveground storage tank. The pickup truck's bed supported an approximately 500 gallon capacity fuel storage tank. An examination of the tank and the asphalt area beneath the truck did not reveal the presence of visibly obvious signs of spills or releases.

One approximately 6-inch diameter water well casing with an attached electric switching box was located adjacent to the east entrance of the structure. A review of available water well data (Groundwater Data for the Portland Basin, Oregon and Washington; U.S. Geological Survey

Open-File Report 90-126) revealed that a 200 foot, 6-inch diameter cased water well was installed by Crowley Maritime at the site in 1974. The water well was reportedly installed for industrial use. An approximately 1½-inch diameter water discharge pipe emerged from the top of the water well casing and was directed towards the structure. The discharge pipe was buried adjacent to the foundation wall.

Three cylinders, approximately 5 feet in height and 8" in diameter, were located adjacent to the east entrance of the structure. The cylinders were labeled as containing Oxygen (O₂) and were stored horizontally upon the north side of the walkway entrance to the structure.

One pad mounted electric power transformer was located adjacent to the south end of the helicopter landing area. The transformer was not labeled regarding PCB content within the cooling oil. The transformer provided electric service to a dock and boat moorage located to the southeast of the project site.

The exterior portions of the project site appeared to be generally clean and free of debris. An examination of the catch basins within the driveway areas revealed they were free of visibly obvious contamination.

Interior Observations

The interior of the office building consisted of carpet and linoleum covered flooring with drop type acoustic ceiling tiles and gypsum board walls. Interior heat was provided by forced air gas, interior air conditioning was provided by roof mounted air conditioning units. Lighting within the structure was provided mainly by fluorescent light fixtures. An inspection of one fluorescent light fixture revealed that the electrical ballast was labeled as containing "No PCBs".

The northeast portion of the structure served as a standby area for the helicopter flight crew. The area supported chairs, couches, a desk and several empty 5-gallon containers labeled "drinking water".

Within a storage cabinet in the central portion of the structure were stored several sealed one pint to one-half gallon containers labeled oil, poly v. activator, paint thinner/cleaner, acetone, and III trichloroethane. The flooring within the storage cabinet did not appear to have been

stained by spills or leaking containers. However, the storage cabinet area did have a moderate odor similar to paint thinner.

The remaining office areas were generally clean and free of debris. Minor amounts of metal parts were stored in the central office area. Five one-gallon, sealed metal containers labeled "SPAR Enamel-Marine Gray Paint" were located in this area.

An examination of the electrical panel and storage room located adjacent to the east entrance of the structure revealed vinyl tile floor covering and press board acoustic ceiling tile. The room contained metal duct work for the heating and air conditioning units. Electric switching equipment was located on the east interior wall of the room. The electric switching equipment was labeled "3-Phase Insulated Transformer". The electric switching equipment in the storage room appeared to provide service to the boat moorage area located to the south of the site. One approximately one-half gallon sealed metal container labeled "Gasoline" was located in the storage room. An approximately 1½-inch diameter floor drain was located in the west side of the storage room. The floor drain appeared to be rusted and the vinyl tile about the drain appeared to be loose and warped from water damage. The purpose of the floor drain in this portion of the structure was not known.

During the course of the site reconnaissance, two samples of suspect asbestos containing building materials were collected for analysis. The samples included linoleum sheet flooring from the kitchen area and vinyl floor tile from the storage room floor.

The results of the asbestos analysis revealed that asbestos (20% chrysotile) fibers were present in the sample of linoleum floor covering from the kitchen area and asbestos fibers (5% chrysotile) were present in the vinyl floor tile and adhesive mastic of the sample acquired from the storage room. The bulk asbestos analysis report is presented in Appendix C.

7.0 Summary

Braun Intertec conducted a level I environmental site assessment to identify potential environmental concerns at 6208 N. Ensign Street in Portland, Oregon. Braun Intertec reviewed geologic information regarding the site and surrounding areas to determine the general geological and hydrogeological characteristics of the project site.

Four Superfund/CERCLIS sites were documented within one-half mile of the site. The mentioned sites were located at the same address. One of the sites has been recommended for no further action (NFA) status by USEPA and is not anticipated to impact the project site. The remaining listings were located approximately 1,600 feet west of the project site in an assumed downgradient groundwater location and are not anticipated to impact the project site.

No NPL sites were documented within one-half mile of the project site.

Nineteen RCRA facilities were documented within one-half mile of the project site. One of the listed facilities, Crowley Environmental Services Corporation, was located on the project site. However, only the corporate offices of the listed facility appear to have been located at the site.

No CRL or Inventory of Hazardous Substance sites were documented within one-half mile of the site.

Eight ECSIS sites were documented within one-half mile of the project site. None of the mentioned ECSIS sites are anticipated to impact the project site.

No Closure and Regular Solid Waste Active Disposal Permit sites were documented within one-half mile of the project site.

Three sites on the list of All Oregon Sources which have acquired air quality permits were documented within one-half mile of the project site.

Nine UST Cleanup sites were documented within one-half mile of the project site. The nearest UST cleanup site, United Parcel Service, 6707 N. Ensign Street, was located approximately 300 feet northwest of the project site in an assumed cross-gradient groundwater location and is not anticipated to impact the site.

One aboveground fuel storage tank was located on the site and twenty registered UST facilities were documented within one-half mile of the project site.

Asbestos containing building materials consisting of vinyl floor tile were detected at the project site.

One 6-inch diameter waterwell was located on the project site.

8.0 Conclusions and Recommendations

The primary environmental concern for the project site is the presence of the aboveground fuel storage tank on the site. Laboratory analysis of one soil sample acquired from an area of minor soil staining adjacent to the fuel dispenser side of the tank revealed the presence of diesel fuel (10 ppm). The most stringent numeric soil cleanup level for diesel fuel contaminated soils as established by the DEQ is 100 ppm.

When no longer in service, Braun Intertec recommends the aboveground storage tank be removed from the site and two soil borings be conducted adjacent to the location of the aboveground storage tank to determine potential petroleum hydrocarbon contamination.

If no longer in service, Braun Intertec recommends the abandonment of the groundwater well located on the project site. The waterwell abandonment should be performed by a licensed waterwell contractor.

Containers of paint, paint thinners, oils and cleaning compounds stored at the project site should be properly disposed of when empty. Sealed containers of flammable substances should be properly stored in a properly designed flammable liquids storage cabinet.

Gas cylinders labeled "Oxygen" should be stored in a vertical position and secured with safety chains.

The floor drain located in the storage room, if no longer of use, should be sealed.

Asbestos containing building materials discovered on the project site do not present a hazard unless disturbed by remodeling or demolition activities. If or when these materials are removed, the work should be performed by a licensed asbestos removal contractor.

9.0 General

Services performed by Braun Intertec geologists, engineers, and environmental scientists for this project have been conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in this area under similar budget and time constraints. No warranty, expressed or implied, is made.

10.0 Reference

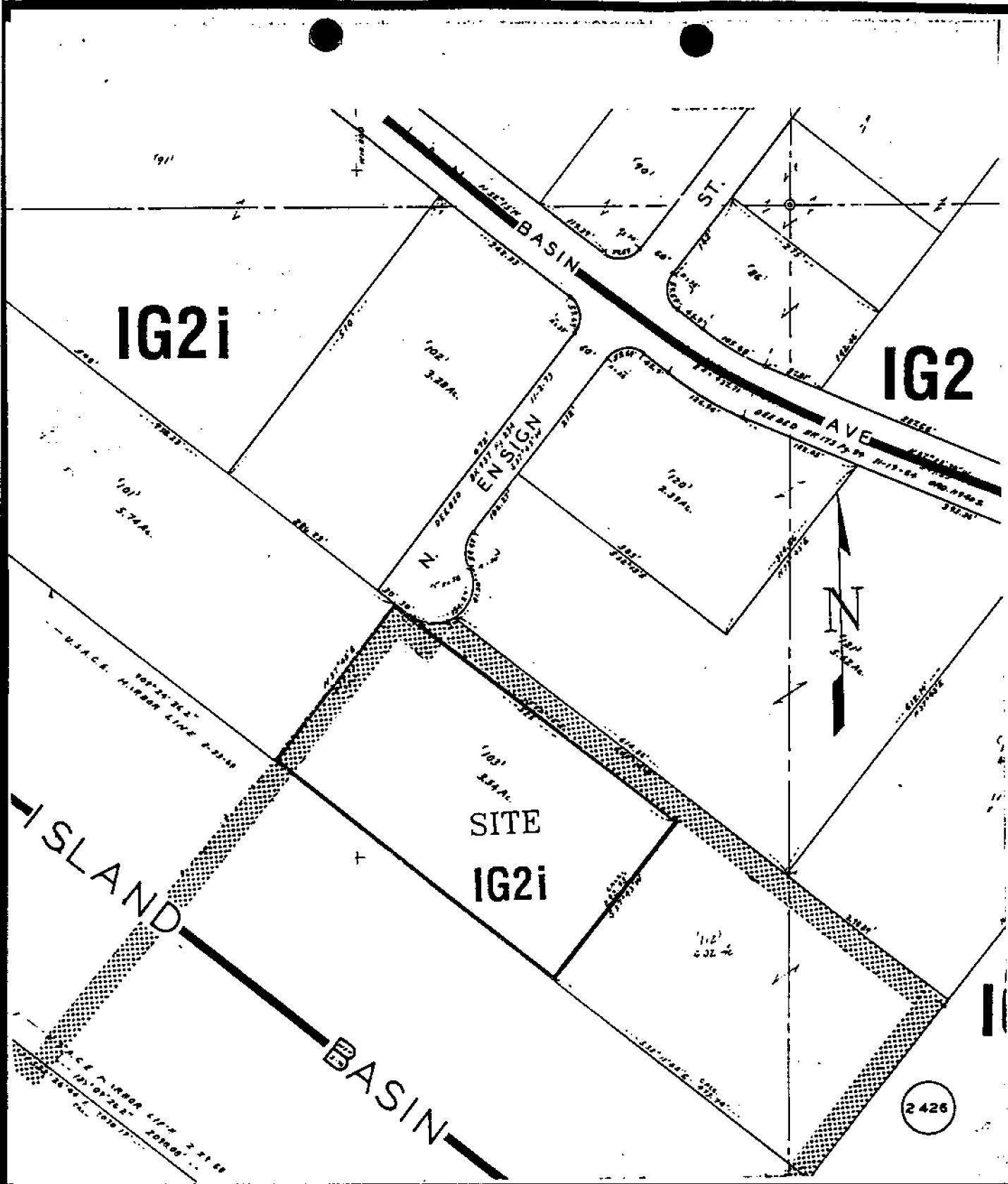
- Beeson, M.H., 1991 Geologic Map of the Portland Quadrangle, Multnomah and Washington Counties, Oregon and Clark County, Washington
- McCarthy, K.A. and Anderson, D.N., 1990, Groundwater Data for the Portland Basin, Oregon and Washington
- USGS Topographic Map, Portland, Oregon-Washington Quadrangle, dated 1961; photorevised 1970 and 1977
- U.S. EPA - Superfund/CERCLIS, April, 1994
- U.S. EPA - RCRA, February, 1994
- U.S. EPA - NPL, April, 1994
- DEQ - Confined Release List and Inventory, December, 1993
- DEQ - Environmental Cleanup Site Information System, April, 1994
- DEQ - Closure and Regular Solid Waste Active Disposal Permits, March, 1994
- DEQ - List of all Oregon Sources, December, 1993
- DEQ - List of UST Cleanup Sites in Oregon, April, 1994
- DEQ - List of UST Facilities in Oregon, March, 1994
- City of Portland Government Offices
- United States Army Corps of Engineers



BRAUN
 INTERTEC

SITE LOCATION MAP
 LEGACY HEALTH SYSTEM FACILITY
 6208 N. ENSIGN STREET
 PORTLAND, OREGON

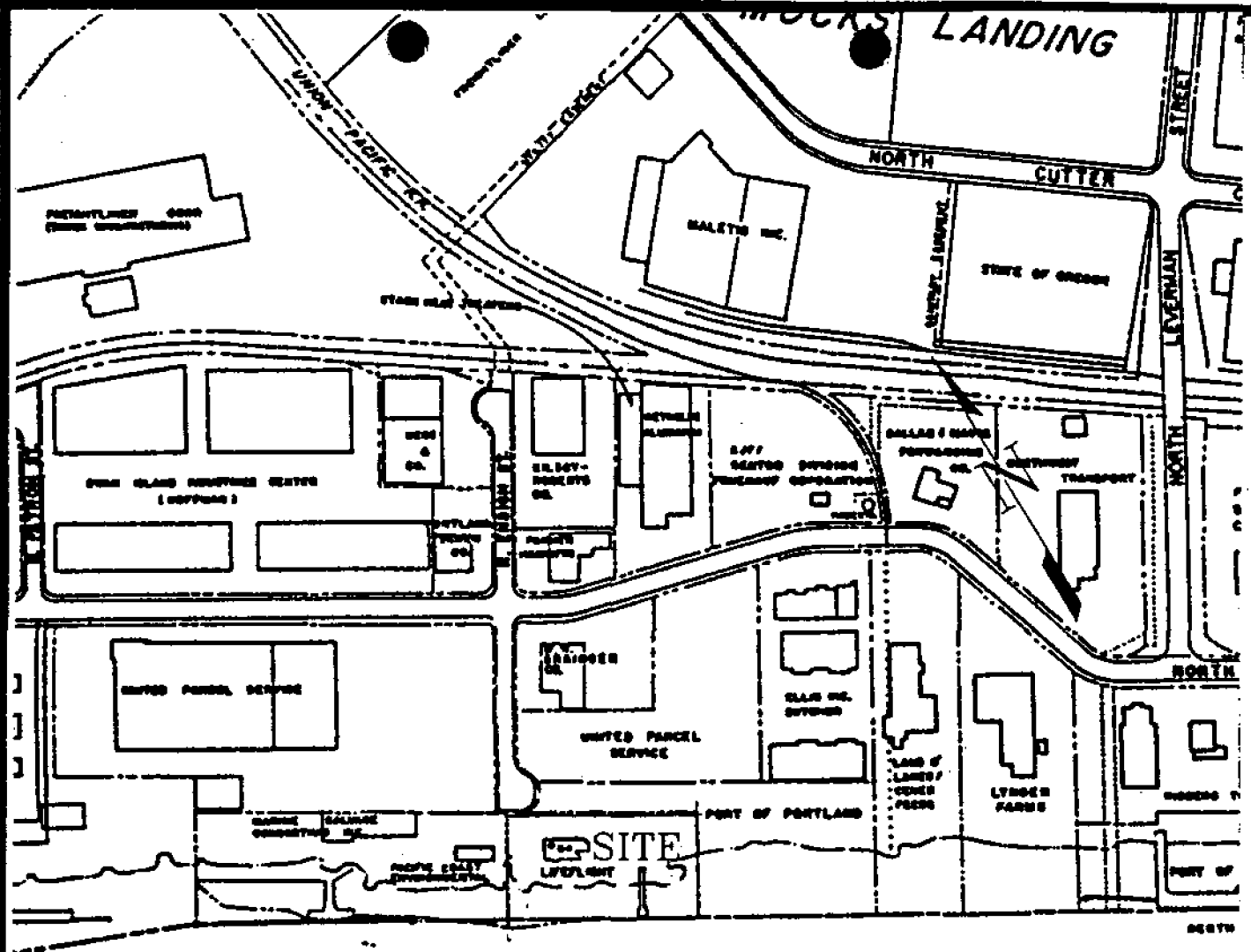
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 JOB NUMBER: EAEX-94-0125
 DATE: 05-31-94
 DRAWING NO. 1 OF 1
 FIGURE NO. 1
 SCALE: N/A



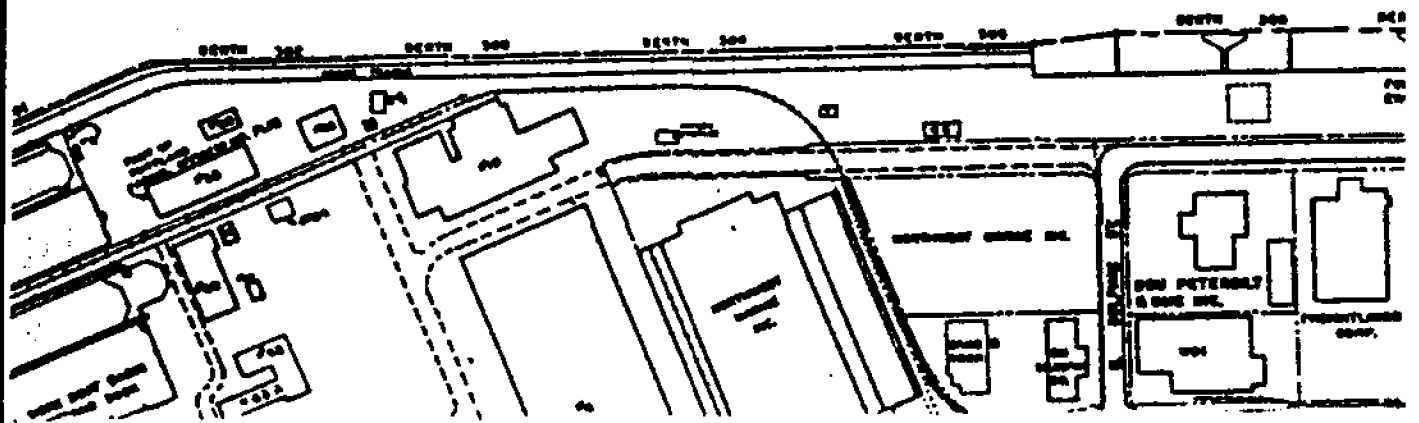
BRAUN
INTERTEC

SITE ZONING MAP
LEGACY HEALTH SYSTEM FACILITY
6208 N. ENSIGN STREET
PORTLAND, OREGON

DRAWN BY: PAS
JOB NUMBER: EAEX-94-0125
DATE: 05-31-94
DRAWING NO. 1 OF 1
FIGURE NO. 2
SCALE: N/A



SWAN ISLAND LA



BRAUN
INTERTEC

SITE LAYOUT MAP
LEGACY HEALTH SYSTEM FACILITY
6208 N. ENSIGN STREET
PORTLAND, OREGON

DRAWN BY: PAS
JOB NUMBER: EAEX-94-0125
DATE: 05-31-94
DRAWING NO. 1 OF 1
FIGURE NO. 3
SCALE: N/A

Appendix A
Historical Aerial Photographs



1936



38-VV W&N-M PD 1 JUNE 48 COL R. FLOOD

1948

7-3280

CE NPP 4 MAY



1957

7-3280

CE NPP 4 MAY

63-2790

MCE

NPP

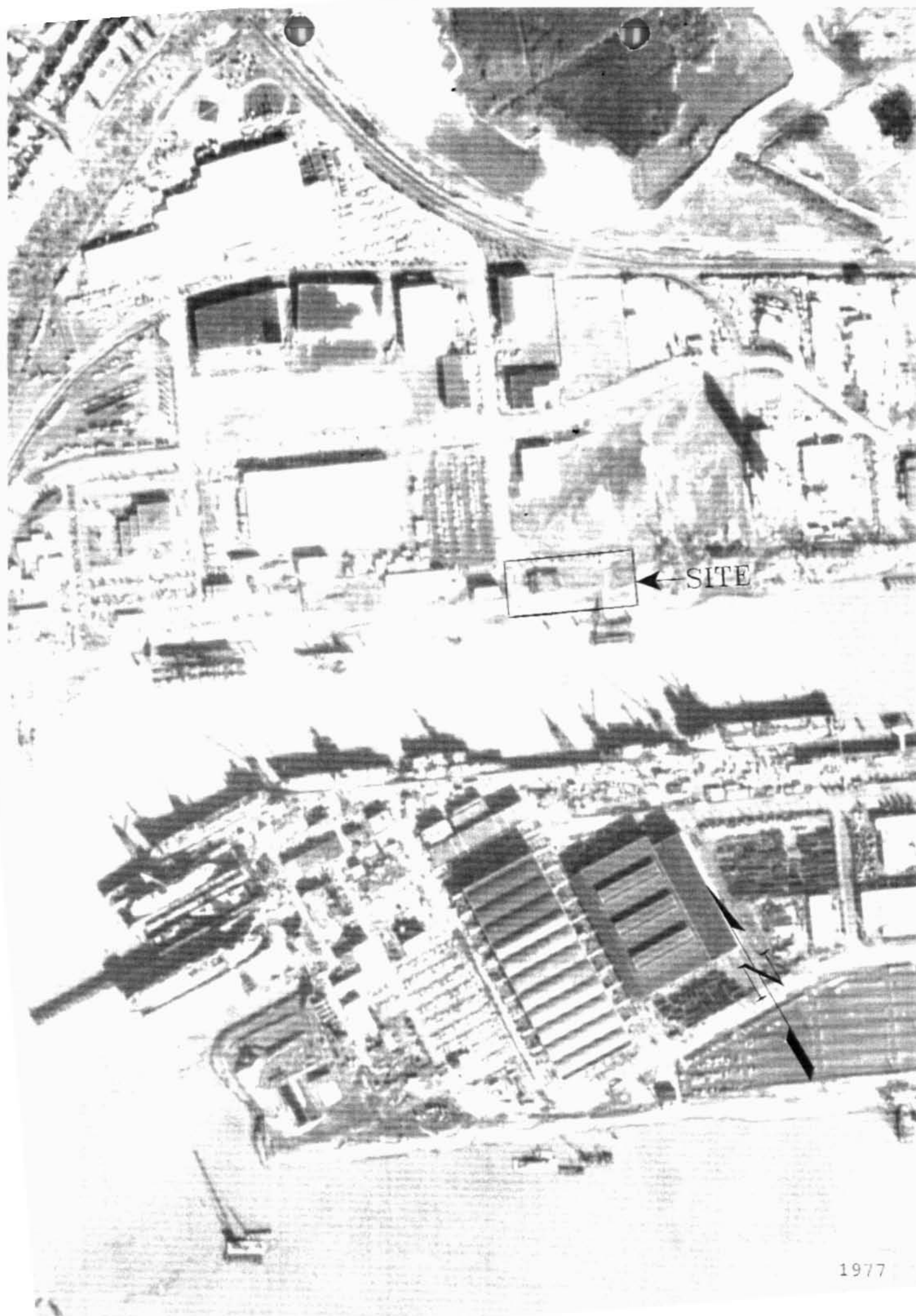
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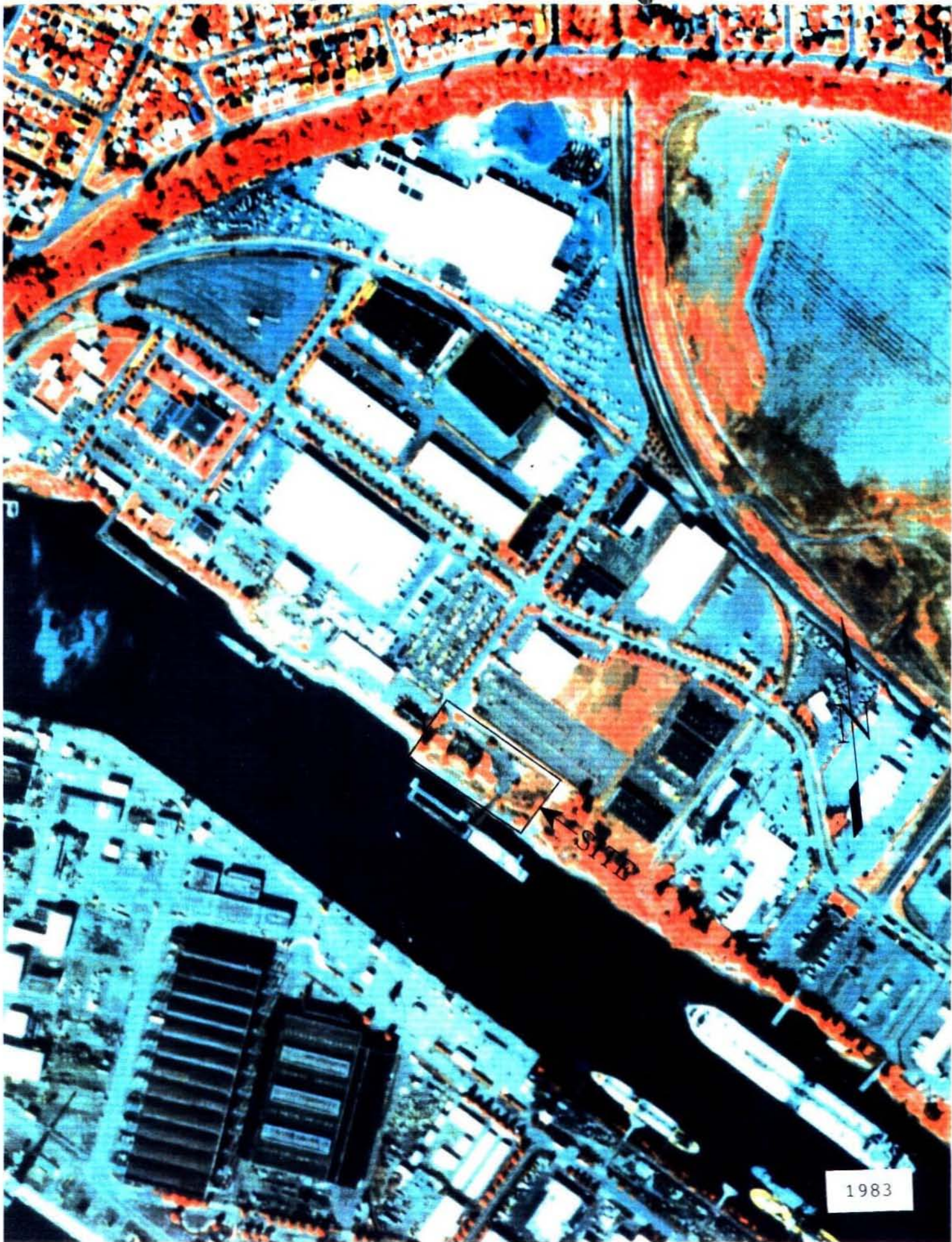


1963

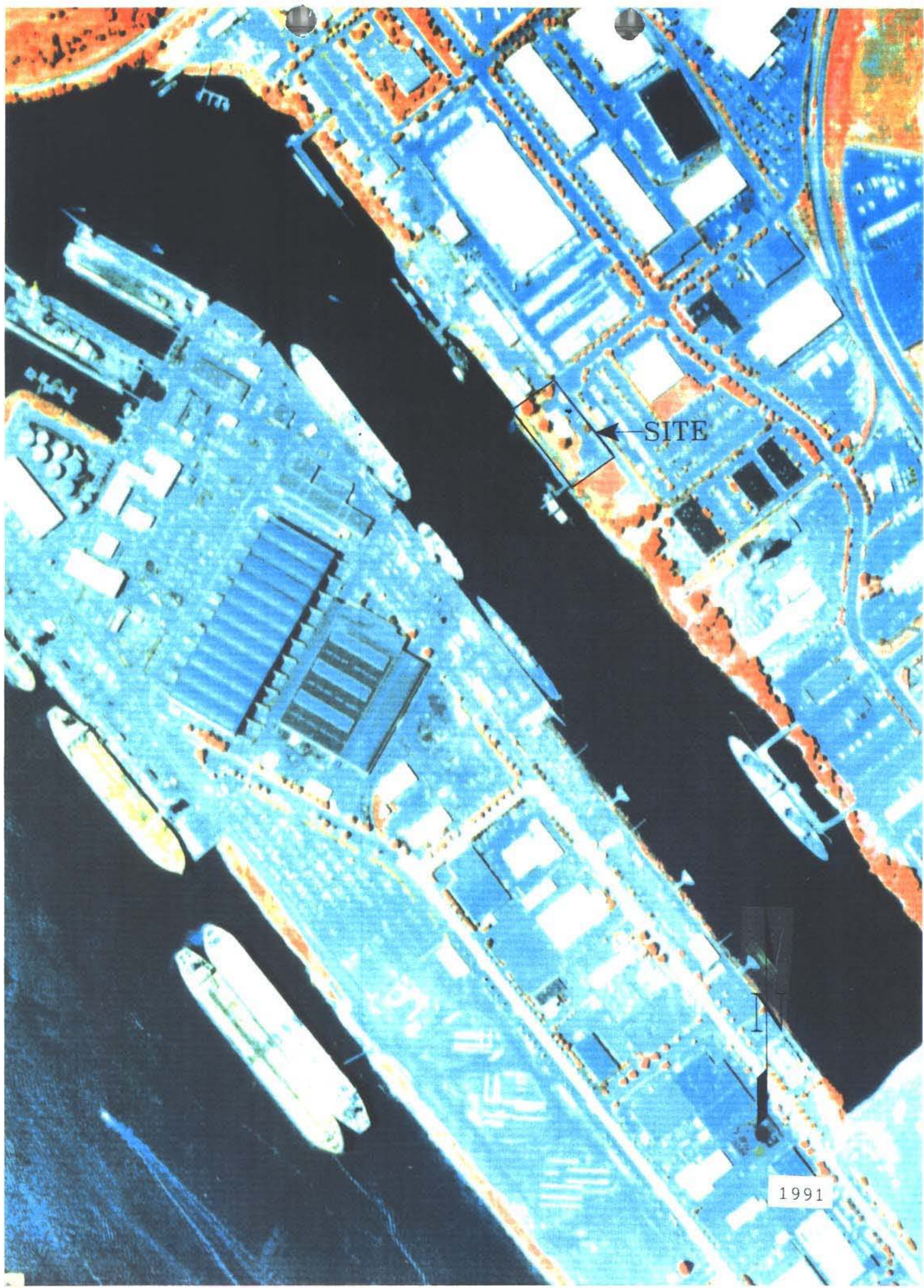


1974





1983



SITE

1991

Appendix B
Site Reconnaissance Photographs



Photograph #1
Date: May 16, 1994
Subject: View of the project site from the southeast looking northwest



Photograph #2
Date: May 16, 1994
Subject: View of the northwest portion of the project site



Photograph #3
Date: May 16, 1994
Subject: View of the northeast portion of the project site



Photograph #4
Date: May 16, 1994
Subject: View of the southeast portion of the project site



Photograph #5
Date: May 16, 1994
Subject: View of the north portion of the project site



Photograph #6
Date: May 16, 1994
Subject: View of the waterwell location



Photograph #7
 Date: May 16, 1994
 Subject: Land use to the west



Photograph #8
 Date: May 16, 1994
 Subject: Land use to the south

Appendix C
Bulk Asbestos Analysis

BULK ASBESTOS ANALYSIS
Marine & Environmental Testing, Inc.
P.O. Box 5693
Portland, Oregon 97228-5693
(503) 282-6920

Client: Braun Intertec

Source: Project EAEX 94-0125

Analyst: David M. Taylor

Date Sampled: 05/16/94

Date Received: 05/16/94

Incoming Log#: G-102

Date Completed: 05/25/94

ANALYTICAL METHOD: EPA, 40 CFR Chapter 1, Part 763, Subpart F,
Appendix A, PLM/Dispersion Staining

Sample (Lab) Client #	Sample Location	Sample Description	Asbestos Content	Other Materials
(1) #1	Kitchen flooring.	Red/brown sheet flooring with white fibrous backing.	20% Chrysotile	20% Cellulose 5% Synthetic material Balance: Particulate/ Vinyl
(2) #2	Storage room flooring.	Beige floor tile with black mastic on one side.	Tile: 5% Chrysotile Mastic: 5% Chrysotile	5% Cellulose Balance: Vinyl/ Particulate

Analyzed by: 

Reviewed by: 

Deviation from method: None.

Percentages are estimates.

Test results pertain only to items tested.

Detection Limit is less than 1% asbestos.

Appendix D
Certificate of Laboratory Analysis
Soil Sample Adjacent to Fuel Storage Tank

CERTIFICATE OF ANALYSIS

CLIENT: BRAUN INTERTEC NW
5405 NORTH LAGOON AVE.
PORTLAND OR 97217

PHONE: (503) 289-1778
FAX: (503) 289-1918

DATE SUBMITTED: 05/16/94

PO#: 6509

PROJECT NAME: EAEX-94-0125

CI SAMPLE #	CLIENTS ID#	DATE	TIME	DESCRIPTION
940580-001-01		05/16/94	1030	SOIL, 6"-12" EAST OF DISPENSER

REPORT DATE: 05/17/94 REPORT NUMBER: 940580 PAGE: 1 OF 1

SAMPLE	TEST	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
940580-001-01	TPH-D OAR-DEQ TPH-D	TPH AS DIESEL	10	PPM	10	Marie B.
940580-001-01	TPH-HCID OAR-DEQ TPH-HCID	GASOLINE DIESEL OIL AND GREASE	ND DIESEL ND	PPM PPM PPM	10 10 100	Marie B.

REVIEWED BY:

David T. Back - Lab Manager

Columbia Inspection, Inc.

7133 N. Lombard St.
P.O. Box 83569, St. Johns Station
Portland, OR 97283-0569
Phone: (503) 286-9464 Fax: (503) 285-7831

ORIGINAL

Attachment B



15830 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9808 (206) 481-9200 • FAX 485-2982
East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
8405 S.W. Nimbus Avenue • Beaverton, OR 97005-7182 (503) 643-9200 • FAX 644-2202

July 31, 1995

Foss Environmental Services Company
9030 NW St. Helens Road
Portland, OR 97283-0357

Attention: Rich Janecek

Re: Quality Control Data
JOB # 41218
P.O.# P 6126
PROJECT - LIFE FLIGHT

NCA project number P507181.

Note: Surrogate Recoveries are included in the final report.

QUALITY CONTROL DEFINITIONS

METHOD BLANK RESULTS

The method blank is an analyte-free matrix which is carried through the same analytical process as the samples. It is used to document contamination that may result from the analytical process.

SURROGATE STANDARD

A surrogate standard (i.e., a chemical compound not expected to occur in an environmental sample) is added to each sample, blank, and matrix spike sample just prior to extraction or processing. The recovery of the surrogate standard is used to monitor for unusual matrix effects, gross sample processing errors, etc. Surrogate recovery is evaluated for acceptance by determining whether the measured concentration falls within accepted limits.



18030 120th Avenue N.E., Suite 101 • Bothell, WA 98011-9508 (206) 481-9200 • FAX 485-2982
East 11115 Montgomery, Suite B • Spokane, WA 99208-4776 (509) 924-9200 • FAX 924-9280
8406 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9900 • FAX 644-9202

TPH-D per Oregon DEQ (C10-C28)
Results in mg/kg (ppm)

Clients: Foss Environmental Services Company
Project: LIFE FLIGHT

NCA Project #: P507181
Matrix: solid
Sampled: 07/14/95
Received: 07/14/95

Client ID	Lab ID	Analyte	Results	MRL	Date Prepared	Date Analyzed
LF-01	P507181-1	Diesel/Related	ND	25	07/20/95	07/20/95
LF-02	P507181-2	Diesel/Related	ND	25	07/20/95	07/20/95

MRL
ND

Method Reporting Level
None Detected at or above the method reporting level
See Comment Section at end of report



18838 120th Avenue N.E., Suite 101 • Bothell, WA 98011-8508 (206) 481-8200 • FAX 485-2992
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SURROGATE RECOVERIES (%)

Client: Foss Environmental Services Company
Project: LIFE FLIGHT

NCA Number: P507181
Received: 07/14/1995

Sample Name	Analyte	Result	Control Limits
TPH-D per Oregon DEQ (C10-C28)			
LF-01	1-Chlorooctadecane	79	50-150
LF-02	1-Chlorooctadecane	77	50-150

MRL
ND
•

Method Reporting Level
None Detected at or above the method reporting level
See Comment Section at end of report



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BATCH QUALITY CONTROL RESULTS
TPH-D per Oregon DEQ (C10-C28)

Client: Foss Environmental Services Company
Project: LIFE FLIGHT

NCA Project #: P507181
Received: 07/14/95

METHOD BLANK
Batch # FC95020c
Results in mg/kg (ppm)

Compound	Result	MRL
Diesel/Related	ND	25
Date Prepared	07/20/95	
Date Analyzed	07/20/95	

Surrogate Recovery (%)	Result	Control Limit
1-Chlorooctadecane	70	50-150

DUPLICATE
Batch # FC95020b
Results in mg/kg (ppm)

Duplicate ID P507207A-1

Compound	Sample Conc	Dup Conc	RPD	QC Limit RPD
Diesel/related	110	110	0	50

LABORATORY CONTROL SAMPLE
Batch # FC95020a
Results in mg/kg (ppm)

Compound	True	Found	% Rec	QC Limit % Rec
Diesel/related	120	120	100	50-150



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Accuracy is measured by percent recovery as in:

$$\% \text{ Recovery} = \frac{(\text{Measured Concentration})}{(\text{Actual Concentration})} \times 100$$

Precision is measured using duplicate tests by relative percent difference.

$$\text{RPD} = \frac{(\text{Result of Test 1} - \text{Result of Test 2})}{(\text{Result of Test 1} + \text{Result of Test 2})/2} \times 100$$

If you should have any questions concerning this report, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Howard Holmes".

Howard Holmes
Project Manager